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Using External Financing in a One Factor Model Measuring the Volatility of Market Risk of Vietnam`s Banking Industry During and After the Global Crisis

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Abstract: This paper evaluates the impact of external financing on market risk for the listed firms in Vietnam`s banking industry, especially during and after the financial crisis 2009-2011.

First of all, by using quantitative and analytical methods to estimate asset and equity beta of total 9 listed companies in Vietnam banking industry with a proper traditional model, we found out that the beta values, in general, for many institutions are acceptable.

Second, under 3 different scenarios of changing leverage (in 2011 financial reports, 30% up and 20% down), we recognized that the risk level, measured by equity and asset beta mean, decreases when leverage increases to 30% and increases more if leverage decreases down to 20%.

Third, by changing leverage in 3 scenarios, we recognized the dispersion of risk level, measured by equity beta var, increases from 0,108 to 0,181 if the leverage increases to 30% whereas decreases to 0,073 if leverage decreases to 20%. But the dispersion measured by asset beta var decreases to 0,007 (leverage up 30%), showing leverage impact.

Finally, this paper provides some outcomes that could provide companies and the government with more evidence in establishing their policies in governance.

Keywords: equity beta, financial structure, financial crisis, risk, external financing, banking industry

JEL CLASSIFICATION : G010, G100, G390

INTRODUCTION

Financial risk might be affected by using external financing in business operation of listed companies. Flifel (2012) stated that the assumption of efficient capital markets is very controversial, especially in times of crisis, and is challenged by research showing that the pricing was distorted by detection of long memory. Gabrijelcic et all (2013) find a significant negative effect of leverage on firm performance. And firms that had some foreign debt financing performed better than their counterparts.

Measuring beta is a popular method used in many models such as the famous CAPM model. Vietnam`s banking industry is selected for the research because there has been no research published until now with the same scope and because Vietnam`s banking industry is considered one of active economic sectors in the local financial market, which has some positive effects for the economy. The purpose of this study, therefore, is to find out the volatility of market risk for this industry increasing or decreasing and to what extent in changing contexts of financial leverage.

We mention some issues on the estimating of impacts of external financing on beta for listed banking industry companies in the Vietnam stock exchange as follows:

>   Issue 1: Whether the risk level of banking industry firms under the different changing scenarios of leverage increase or decrease so much.

>   Issue 2: Whether the disperse distribution of beta values become large in the different changing scenarios of leverage estimated in the banking industry.

Besides, we also propose some hypotheses for the above issues:

>   Hypothesis 1: because using leverage may strongly affect business returns, changing leverage scenarios could strongly affect firm risk.

>   Hypothesis 2: as external financing is vital for the business development, there will be large disperse in beta or risk values estimated.

This paper is organized as follow. The research issues and literature review and methodology will be covered in next sessions 2 and 3, for a short summary. Next session presents empirical results and findings. The last session shows discussion and concludes with some policy suggestions. This paper also supports readers with references, exhibits and relevant web sources.

THEORETICAL BACKGROUND

A. Conceptual theories
The impact of financial leverage on the economy

Financial development and economic growth are positively interrelated. The interaction between these two fields can be considered as a circle in which good financial development causes economic growth and vice versa. A sound and effective financial system has positive effect on the development and growth of the economy. Financial institutions and markets can enable corporations to solve liquidity needs and enhance long-term investments. This system include many channels for a firm who wants to use financial leverage or FL, which refers to debt or to the borrowing of funds to finance a company's assets.

In a specific industry such as the banking industry, using leverage with a decrease or increase in certain periods could affect tax obligations, revenues, profit after tax, technology innovation and compensation, and jobs in the industry.

During and after financial crises such as the 2007-2009 crisis, concerns are raised about the role of financial leverage of many countries, in both developed and developing markets. On one hand, lending programs and packages might support the business sectors, while it might create more risks for the business and economy on the other hand.

B. Methodology

For calculating systemic risk results and leverage impacts, in this study, we use the live data during the crisis period 2009-2011 from the stock exchange market in Vietnam (HOSE and HNX and UPCOM).

In this research, analytical research method, philosophical method, and the leverage scenario analysis method are used. Analytical data is from the situation of listed banking industry firms in VN stock exchange and the current tax rate is 25%.

Generally speaking, quantitative method is mainly used in this study with a note that risk measure asset beta is mainly derived from equity beta and financial leverage.

Finally, we use the results to suggest policy for both these enterprises, relevant organizations and government.

C. Previous Studies

Fama, Eugene F., and French, Kenneth R., (2004) also indicated in the three factor model that "value" and "size" are significant components which can affect stock returns. They also mentioned that a stock return not only depends on a market beta, but also on market capitalization beta. The market beta is used in the three factor model, developed by Fama and French, which is the successor to the CAPM model by Sharpe, Treynor and Lintner.

Dimitrov (2006) documented a significantly negative association between changes in financial leverage and contemporaneous risk-adjusted stock returns. Aydemir et all (2007) identified that in an economy with more realistic variation in interest rates and the price of risk, there is a significant variation in stock return volatility at the market and firm level. In such an economy, financial leverage has little effect on the dynamics of stock return volatility at the market level. Financial leverage contributes more to the dynamics of stock return volatility for a small firm. Then, Maia (2010) stated the main determinants of firms' capital structures are related to firms' sensitivities to these systematic sources of risk and they affect asymmetrically low and high leverage firms. And temporary shocks are relatively more important for low leverage firms, and that financial distress risk seems to be captured by the sensitivity of firms' cash flow innovations to market discount rate news.

Umar (2011) found that firms which maintain good governance structures have leverage ratios that are higher (forty-seven percent) than those of firms with poor governance mechanisms per unit of profit. Chen et all (2013) supported regulators' suspicions that overreliance on short-term funding and insufficient collateral compounded the effects of dangerously high leverage and resulted in undercapitalization and excessive risk exposure for Lehman Brothers. The model reinforces the importance of the relationship between capital structure and risk management. Then, Alcock et all (2013) found evidence that leverage cannot be viewed as a long-term strategy to enhance performance, but in the short term, managers do seem to add significantly to fund excess returns by effectively timing leverage choices to the expected future market environment. Gunaratha (2013) revealed that in different industries in Sri Lanka, the degree of financial leverage has a significant positive correlation with financial risk. And Dakic (2014) stated that a global consent has been reached on ensuring financial stability through the interaction of monetary, fiscal and prudential policy to ensure the necessary macroprudential dimension of regulatory and supervisory frameworks. Then, Timothy (2016) showed that constrained firms (financial) have statistically different responses to policy than unconstrained firms. Miomir and Milica (2018)

pointed that in recent two decades, due to contributions of political macroeconomics, the focus of macroeconomics turned away from a narrow perspective based on market and privatisation (market fundamentalism) towards a broader perspective based on institutions and values (institutionalism). Last but not least, Asanovic (2018) mentioned that banking system indicators have higher impact on probability of systemic banking crisis occurrence compared to macroeconomic indicators.

Finally, financial leverage can be considered as one among many factors that affect business risk of consumer good firms.

EMPIRICAL ANALYSIS

A. General Data Analysis

The research sample has 9 listed firms in the banking industry market with the live data from the stock exchange.

Firstly, we estimate equity beta values of these firms and use financial leverage to estimate asset beta values of them. Secondly, we change the leverage from that reported in 2011 financial statements (FS 2011) to increasing 30% and reducing 20% to see the sensitivity of beta values. We found out that in 3 cases, asset beta mean values are estimated at 0,034, -0,075 and 0,130 which are sensitive and negatively correlated with the leverage. Also in 3 scenarios, we find out equity beta mean values (0,439, 0,369 and 0,492) are negatively correlated with the leverage. Leverage degree changes definitely have certain effects on asset and equity beta values.

B. Empirical Research Findings and Discussion

In the section below, data used are from 9 listed banking industry companies on VN stock exchange (HOSE and HNX mainly). In the scenario 1, current financial leverage degree is kept as in the 2011 financial statements which is used to calculate market risk (beta). Then, two (2) FL scenarios are changed up to 30% and down to 20%, compared to the current FL degree.

Market risk (beta) under the impact of tax rate, includes: 1) equity beta; and 2) asset beta.

B.1 Scenario 1: current financial leverage (FL) as in FS 2011

In this case, all beta values of 9 listed firms on VN banking industry market are as presented in Table 1:

Table 1 – Market risk of listed companies on VN banking industry market

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (FS)
1	ACB	0,636	0,031		76,2%
2	CTG	0,554	0,031		75,5%
3	EIB	0,385	0,036		72,4%
4	HBB	0,134	0,014	SHB as comparable	71,7%
5	MBB	0,072	0,005	STB as comparable	74,0%
6	NVB	0,021	0,003	HBB as comparable	70,1%
7	SHB	1,004	0,082		73,4%
8	STB	0,734	0,072		72,2%
9	VCB	0,408	0,030		74,1%
				Average	73,3%

Source: Vietnam stock exchange 2012

B.2. Scenario 2: financial leverage increases up to 30%

If leverage increases up to 30%, all beta values of 9 listed firms on VN banking industry market are as showed in Table 2:

Table 2 – Market risks of listed banking industry firms (case 2)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (30% up)
1	ACB	0,636	-0,151		123,8%
2	CTG	0,554	-0,126		122,7%
3	EIB	0,385	-0,068		117,7%
4	HBB	-0,235	0,039	SHB as comparable	116,6%
5	MBB	-0,213	0,043	STB as comparable	120,2%
6	NVB	0,046	-0,006	HBB as comparable	114,0%
7	SHB	1,004	-0,194		119,3%
8	STB	0,734	-0,127		117,3%
9	VCB	0,408	-0,084		120,5%
				Average	119%

Source: Vietnam stock exchange 2012

B.3. Scenario 3: leverage decreases down to 20%

If leverage decreases down to 20%, all beta values of 9 listed firms on the banking industry market in VN are as presented in Table 3:

Table 3 – Market risk of listed banking industry firms (case 3)

Order No.	Company stock code	Equity beta	Asset beta (assume debt beta = 0)	Note	Financial leverage (20% down)
1	ACB	0,636	0,152		76,2%
2	CTG	0,554	0,136		75,5%
3	EIB	0,385	0,106		72,4%
4	HBB	0,346	0,098	SHB as comparable	71,7%
5	MBB	0,234	0,061	STB as comparable	74,0%
6	NVB	0,125	0,037	HBB as comparable	70,1%
7	SHB	1,004	0,267		73,4%
8	STB	0,734	0,204		72,2%
9	VCB	0,408	0,106		74,1%
				Average	73%

Source: Vietnam stock exchange 2012

All three tables and data show that values of equity and asset beta in the case of increasing leverage up to 30% or decreasing leverage degree down to 20% have certain fluctuations.

C. Comparing statistical results in 3 scenarios of changing leverage:

Table 4 - Statistical results (FL in case 1)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	1,004	0,082	0,9214
MIN	0,021	0,003	0,0185
MEAN	0,439	0,034	0,4049
VAR	0,1081	0,0008	0,1074
	Note: Sample size : 9		

Source: Vietnam stock exchange 2012

Table 5 – Statistical results (FL in case 2)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	1,004	0,043	0,9607
MIN	-0,235	-0,194	-0,0409
MEAN	0,369	-0,075	0,4438
VAR	0,1814	0,0071	0,1743
		Note: Sample size : 9	

Source: Vietnam stock exchange 2012

Table 6- Statistical results (FL in case 3)

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	1,004	0,267	0,7371
MIN	0,125	0,037	0,0878
MEAN	0,492	0,130	0,3623
VAR	0,0733	0,0050	0,0682
		Note: Sample size : 9	

Source: Vietnam stock exchange 2012

Based on the indicated results, we find out:

Equity beta mean values in all 3 scenarios are low (< 0,5) and asset beta mean values are also small (< 0,2). In the case of reported leverage in 2011, equity beta value fluctuates in an acceptable range from 0,021 (min) up to 1,004 (max) and asset beta fluctuates from 0,003 (min) up to 0,082 (max). If leverage increases to 30%, equity beta moves in a range from -0,235 to 1,004 and asset beta moves from -0,194 (min) up to 0,043 (max). Hence, we note that there is a decrease in equity beta min value if leverage increases. When leverage decreases down to 20%, equity beta value moves in a range between 0,125 and 1,004 and asset beta changes from 0,037 (min) up to 0,267 (max). So, there is an increase in equity beta min value when leverage decreases in scenario 3.

Besides, Exhibit 4 informs us that in the case 30% leverage up, average equity beta value of 9 listed firms decreases down to -0,07 while average asset beta value of these 9 firms decreases little more to -0,109. Then, when leverage reduces to 20%, average equity beta value of 9 listed firms goes up little to 0,053 and average asset beta value of 9 firms up to 0,096.

The chart 1 shows us : when leverage degree decreases down to 20%, average equity and asset beta values decrease to 0,492 and 0,130 compared to those at the initial reported leverage (0,034 and 0,439). Then, when leverage degree increases up to 30%, average equity beta decreases little less and average asset beta value also decreases less (to 0,369 and -0,075). However, the fluctuation of equity beta value (0,181) in the case of 30% leverage up is higher than (>) the results in the rest 2 leverage cases. And we could note that the using of leverage in the case of 30% leverage up causes an increase in asset beta var down to 0,007 (compared to 0,001).

Figure 1 – Comparing statistical results of three (3) scenarios of changing FL (period 2009-2011)
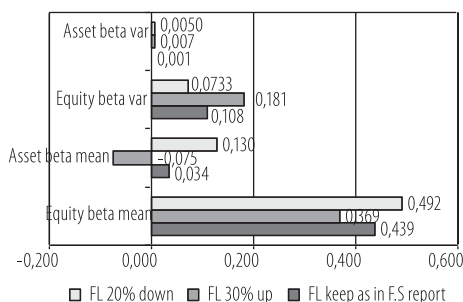
Figure 2 – Comparing statistical results of three (3) scenarios of changing FL (period 2007-2011)
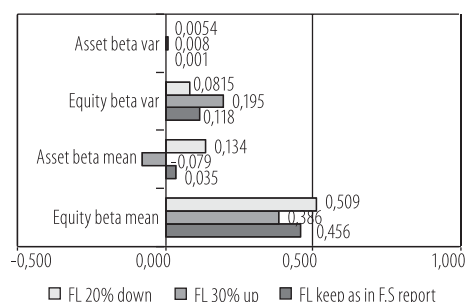
Source: Vietnam stock exchange 2012

D. Empirical results

In scenario 1 (current FL), asset and equity beta mean reach the relatively medium values (0,034 and 0,439) whereas asset beta var also reaches minimum (0,001), compared to the rest 2 cases.

In scenario 2 (FL 30%), asset and equity beta min reach minimum values (-0,075 and 0,369) whereas equity beta var reaches maximum (0,181), compared to the rest 2 cases.

And finally, in scenario 3 (FL down 20%), asset and equity beta mean reach minimum values while asset beta var reaches medium value also (0,005), compared to the rest 2 cases.

E. Risk analysis

In short, the using of financial leverage could have both negatively or positively impacts on the financial results or return on equity of a company. The more debt the firm uses, the more risk it takes. Besides, the increasing interest on loans might drive the earning per share (EPS) lower.

On the other hand, in the case of increasing leverage, the company will expect to get more returns. The financial leverage becomes worthwhile if the cost of additional financial leverage is lower than the additional earnings before taxes and interests (EBIT). Considering risk vs. return, FL becomes a decisional variable for managers. And the maximum risk that a firm accepts will ask for the maximum financial leverage.

F. Discussion

Looking at figure 2, it is noted that in case leverage up 30%, during 2009-2011 period, asset beta mean of banking industry is higher than while equity beta mean is lower than those in the period 2007-2011, (-0,075 and 0,369) compared to (-0,079 and 0,386). Looking at exhibit 6, we can see asset beta mean and equity beta mean are lower than those of consumer good industry (0,336 and 0,694). This relatively shows us that financial leverage does affect asset beta values.

CONCLUSION

In general, the government has to consider the impacts on the mobility of capital in the markets when it changes the macro policies. Besides, it continues to increase the effectiveness of building the legal system and regulation supporting the plan of developing banking market. The Ministry of Finance continues to increase the effectiveness of fiscal policies and tax policies which are needed to combine with other macro policies at the same time. The State Bank of Vietnam continues to increase the effectiveness of capital providing channels for banking companies as we could note that in this study when leverage is going to increase up to 30%, the risk level decreases, compared to the case it is going to decrease down to 20%. And for the corporations, figure 2 tells us that decreasing leverage increases risk both in the period 2009-2011 and in the 2007-2011 period.

Furthermore, the entire efforts among many different government bodies need to be coordinated.

Finally, this paper suggests implications for further research and policy suggestion for the Vietnam government and relevant organizations, economists and investors from current market conditions.

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Appendix 1. Interest rates in banking industry during crisis

Year	Borrowing Interest rates	Deposit Rates	Note
2011	18%-22%	13%-14%	Approximately
2010	19%-20%	13%-14%	(2007: required reserves ratio at
2009	9%-12%	9%-10%	SBV is changed from 5% to 10%)
2008	19%-21%	15%-16,5%	(2009: special supporting interest
2007	12%-15%	9%-11%	rate is 4%)

source: Vietnam commercial banks

Appendix 2. Basic interest rate changes in Vietnam

Year	Basic rate	Note
2011	9%	
2010	8%	
2009	7%	
2008	8,75%-14%	Approximately, fluctuated
2007	8,25%	
2006	8,25%	
2005	7,8%	
2004	7,5%	
2003	7,5%	
2002	7,44%	
2001	7,2%-8,7%	Approximately, fluctuated
2000	9%	

source: State Bank of Vietnam and Vietnam economy

Appendix 3. Inflation, GDP growth and macroeconomics factors

| Year	Inflation	GDP	USD/VND rate
2011	18%	5,89%	20.670
2010	11,75% (Estimated at Dec 2010)	6,5% (expected)	19.495
2009	6,88%	5,2%	17.000
2008	22%	6,23%	17.700
2007	12,63%	8,44%	16.132
2006	6,6%	8,17%	
2005	8,4%		
Note		approximately	

source: Vietnam commercial banks and economic statistical bureau

Appendix 4. Increase/decrease risk level of listed hotel and entertainment industry firms under changing scenarios of leverage : in 2011 F.S reports, 30% up, 20% down in the period 2009 - 2011

Order No.	Company stock code	FL keep as in F.S report		FL 30% up		FL 20% down	
		Equity beta	Asset beta	Increase / Decrease (equity beta)	Increase / Decrease (asset beta)	Increase / Decrease (equity beta)	Increase / Decrease (asset beta)
1	ACB	0,636	0,031	0,000	-0,182	0,000	0,121
2	CTG	0,554	0,031	0,000	-0,157	0,000	0,105
3	EIB	0,385	0,036	0,000	-0,104	0,000	0,070
4	HBB	0,134	0,014	-0,368	0,025	0,212	0,084
5	MBB	0,072	0,005	-0,284	0,038	0,163	0,056
6	NVB	0,021	0,003	0,025	-0,009	0,104	0,035
7	SHB	1,004	0,082	0,000	-0,276	0,000	0,184
8	STB	0,734	0,072	0,000	-0,199	0,000	0,133
9	VCB	0,408	0,030	0,000	-0,114	0,000	0,076
			Average	-0,070	-0,109	0,053	0,096

source: Vietnam stock exchange 2012

Appendix 5. VNI Index and other stock market index during crisis 2006-10
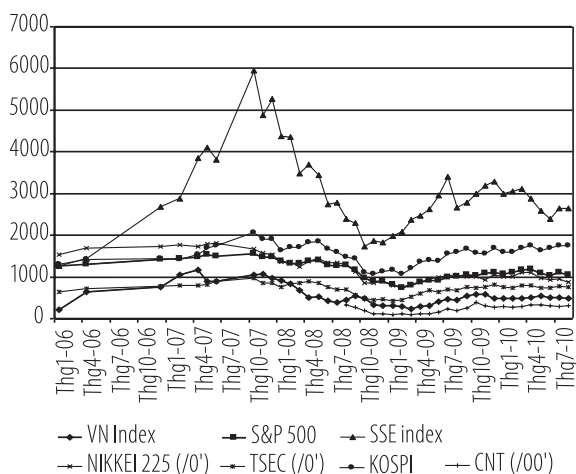
Appendix 6. Comparing statistical results of three (3) scenarios of changing FL of 121 listed firms in the consumer good industry
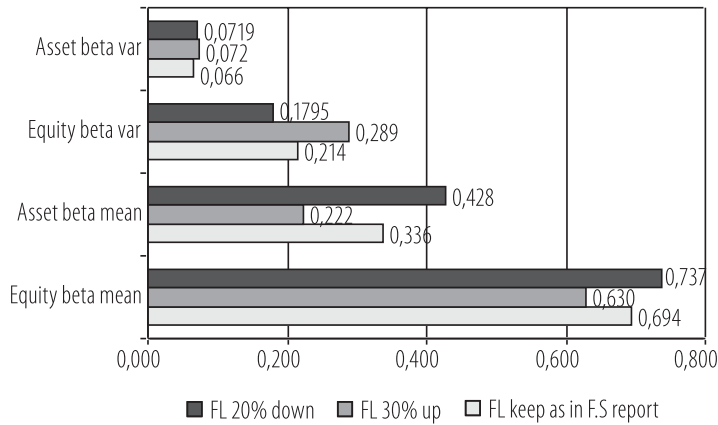
Source: Vietnam stock exchange 2012

Author note: My sincere thanks are for the editorial office and Lecturers/Doctors at Banking University and International University of Japan. Through the qualitative analysis, please kindly email me if any error found.